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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Shequan Gou

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EXAMINER

ALLEN, CAMERON J

ART UNIT

PAPER NUMBER

1797

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/569,967	Applicant(s) GOU ET AL.
	Examiner CAMERON J. ALLEN	Art Unit 1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6-8, and 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Feke et al. US 5,085,783.

Regarding claim 1, Feke discloses a method for demulsifying water-oil emulsions (Column 6 line 29) through ultrasonic action (Column 9 line 1-7), comprising a step of making water-oil emulsions flow through at least one ultrasonic acting region in a flow direction (Figure 1 section A-B direction 1), characterized in that: within said ultrasonic acting region, a concurrent ultrasonic wave whose traveling direction is the same as the flow direction of said water-oil emulsions is generated by at least one first ultrasonic transducer (Figure 1 transducer 14) provided at the upstream end of said ultrasonic acting region, and at same time, a countercurrent ultrasonic wave whose traveling

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direction is opposite to the flow direction of said water-oil emulsions; and the concurrent ultrasonic wave and the countercurrent ultrasonic wave act simultaneously on the water-oil emulsions flowing through said ultrasonic acting region (Figure 1 transducer 22), so as to demulsify said water-oil emulsions

Regarding claim 2, Feke discloses the method according to Claim 1, characterized in that, the orientation of the central axis of said ultrasonic acting region is identical with said flowing direction in which said water-oil emulsions flow through said ultrasonic acting region. (Figure 1 Transducers 14 and 22 direction 1 region C-A-B)

Regarding claim 3, Feke discloses the method according to Claim 1, characterized in that, said concurrent ultrasonic wave and the countercurrent ultrasonic wave travel with uniform sound intensity within said ultrasonic acting region; the sound intensity of said countercurrent ultrasonic wave is no lower than that of said concurrent ultrasonic wave. (Column 7 line 67-68 and Column 8 line 1) The examiner interprets Mirror image to be waves of equal intensity.

Regarding claim 6, Feke discloses a demulsifying device for implementing the method according to Claim 1, the demulsifying device comprising at least one ultrasonic acting region (Figure 1 section C-A-B) in which water-oil emulsions flow, characterized in that, at the upstream end of said ultrasonic acting region there is mounted the first ultrasonic transducer (Figure 1 transducer 14) for generating a concurrent ultrasonic wave whose traveling direction (Figure 1 direction 1) is the same as the flow direction of said water-oil emulsions, and at the downstream end of said ultrasonic acting region there is mounted a second transducer (Figure 1 22) capable of generating a

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countercurrent ultrasonic wave whose traveling direction is opposite to the flow direction of said water-oil emulsions; and a ultrasonic generator is connected with said first transducers via ultrasonic power lines, so as to drive said first ultrasonic transducers to generate said concurrent ultrasonic wave and said countercurrent ultrasonic wave (Figure 1 generator 12 and 20 and transducer 14 and 22)(Column 8 line 13-27), at the downstream end of said ultrasonic acting region there is mounted the second ultrasonic transducer.(Figure 1 transducer 22)

Regarding claim 7, Feke discloses the demulsifying device according to Claim 6, and is connected with other water-oil emulsion pipes in production and processing (The Examiner interprets this to be inherent to the feed entering and exiting the apparatus) said ultrasonic acting region is of a pipe structure. (Figure 1 tube 10)

Regarding claim 8, Feke discloses the demulsifying device according to Claim 7, wherein said ultrasonic acting region is of a pipe structure with a constant diameter. Feke does disclose that the region is a channel of constant diameter. (Figure 1 10)

Regarding claim 14, Feke discloses a method for demulsifying a water-oil (Column 6 line 29) emulsion through ultrasonic action (Column 9 line 6), comprising a step of making the water-oil emulsion flow through at least one ultrasonic acting region (Region C-A-B)in a flow direction such that (Figure 1 direction 1), within said ultrasonic acting region, a concurrent ultrasonic wave whose traveling direction is the same as the flow direction of said water-oil emulsion is generated by at least a first ultrasonic transducer (Figure 1 #14) provided at an upstream end of said ultrasonic acting region and, at the same time, a countercurrent ultrasonic wave whose traveling direction is

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opposite to the flow direction of said water-oil emulsion is generated by at least a second ultrasonic transducer provided at a downstream end of said ultrasonic acting region; (Figure 1 #22) wherein the concurrent ultrasonic wave and the countercurrent ultrasonic wave act simultaneously on the water-oil emulsion flowing through said ultrasonic acting region to demulsify said water-oil emulsion (Column 6 line 29) with the combined action of the concurrent and countercurrent ultrasonic waves having a demulsifying effect that is greater than that of the concurrent or countercurrent ultrasonic wave alone. (Inherent to the device in use) (Column 8 line 13-27)

Regarding claim 15, Feke discloses the method according to Claim 14, wherein said ultrasonic acting region has a central axis (Figure 1 center of tube 10) with an orientation that is identical with said flow direction (Figure 1 direction 1) in which said water-oil emulsion flows through said ultrasonic acting region. (Region C-A-B)

Regarding claim 16, Feke discloses the method according to Claim 14, wherein the concurrent ultrasonic wave and the countercurrent ultrasonic wave travel with uniform sound intensity within said ultrasonic acting region; the sound intensity of said countercurrent ultrasonic wave being no lower than that of said concurrent ultrasonic wave. (Column 7 line 67-68 and Column 8 line 1) The examiner interprets Mirror image to be waves of equal intensity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4, 5, 9-13, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feke et al. US 5,085,783.

Regarding claim 4, Feke discloses the method according to Claim 1, characterized in that, the sound intensity of said countercurrent ultrasonic wave is no higher than $0.8\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no higher than $0.8\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art

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at the time the invention was made to make the wave no higher than $0.8\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 5, Feke discloses the method according to Claim 4, but does not disclose characterized in that, the sound intensity of said countercurrent ultrasonic wave is no higher than $0.5\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no higher than $0.5\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than $0.5\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 9, Feke discloses the demulsifying device according to Claim 7, but does not disclose said ultrasonic acting region is of a pipe structure with a varying diameter. Feke does disclose the region is constant. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the diameter of the pipe since it as been held that mere changes in size or shape are not patentably distinct if it would not perform differently than the prior art, the claimed device was not patentably distinct from the prior art device. *MPEP 2144.04*

Regarding claim 10, Feke discloses the method according to Claim 2, characterized in that, the sound intensity of said countercurrent ultrasonic wave is no higher than $0.8\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no

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higher than $0.8\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than $0.8\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 11, Feke discloses the method according to Claim 3, characterized in that, the sound intensity of said countercurrent ultrasonic wave is no higher than $0.8\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no higher than $0.8\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than $0.8\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 12, Feke discloses the method according to Claim 10, characterized in that, the sound intensity of said countercurrent ultrasonic wave is no higher than $0.5\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no higher than $0.5\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than $0.5\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 13, Feke discloses the method according to Claim 11,

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characterized in that, the sound intensity of said countercurrent ultrasonic wave is no higher than $0.5\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no higher than $0.5\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than $0.5\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 17, Feke discloses the method according to Claim 14, wherein the sound intensity of said countercurrent ultrasonic wave is no higher than $0.8\text{W}/\text{cm}^2$. Feke discloses the claimed invention except for wave is no higher than $0.8\text{W}/\text{cm}^2$. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than $0.8\text{W}/\text{cm}^2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 18, Feke discloses the method according to claim 16, wherein the ultrasonic acting region comprises a pipe structure with varying diameter. Feke does disclose the region is constant. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the diameter of the pipe since it as been held that mere changes in size or shape are not patentably distinct if it would not perform differently than the prior art, the claimed device was not patentably distinct from the prior art device. *MPEP 2144.04*

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Regarding claim 19, Feke discloses the method according to claim 17, wherein the sound intensity of the countercurrent ultrasonic wave is no higher than 0.5 W/cm^2 . Feke discloses the claimed invention except for wave is no higher than 0.5 W/cm^2 . It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wave no higher than 0.5 W/cm^2 , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAMERON J. ALLEN whose telephone number is (571)270-3164. The examiner can normally be reached on M-Th 9-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CJA

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797